

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) ~~Device~~ A device for fusion and interfacial agitation of a diphasic system, the latter comprising first and second immiscible phases separated by an interface, this device comprising:
  - a crucible (2, 28), ~~intended~~ configured to contain the diphasic system and
  - a fusion and agitation means provided for the fusion of mechanism configured to fuse the first and second phases and ~~the agitation of to agitate~~ their interface, this device being characterised in that the fusion and agitation ~~means include~~ mechanism includes:
    - a single inductor (4) surrounding the crucible and
    - a single ~~means of supplying (18)~~ electrical circuit configured to supply this inductor by a single variable current with first and second components, the first component having a ~~first~~ high frequency and being ~~capable of melting~~ configured to melt the first and second phases, the second component having a ~~second~~ low frequency which is lower than the ~~first~~ high frequency, and ~~capable of agitating~~ being configured to agitate the interface of the first and second phases.
2. (Currently Amended) ~~Device~~ The device according to claim 1, in which the ~~means (18)~~ for supplying single electrical circuit configured to supply the inductor ~~are capable of providing~~ is configured to provide an alternative current with the ~~first~~ high frequency, this alternative current being modulated by the ~~second~~ low frequency.
3. (Currently Amended) ~~Device~~ The device according to claim 2, in which the ~~means of supplying~~ single electrical circuit configured to supply the inductor ~~include~~ includes:
  - a capacitor (24) forming, with the inductor (4), an oscillating circuit that operates at its own resonance frequency, this resonance frequency forming the ~~first~~ high frequency,
  - an induction generator (22) ~~provided~~ configured to supply this oscillating circuit and
  - a function generator (20) ~~provided~~ configured to impose modulation at the ~~second~~ low frequency and to supply a reference current to the induction generator.

4. (Currently Amended) ~~Device~~ The device according to claim 3, in which the power of the induction generator ~~(22)~~ is in the interval from 10 kW to 300 kW.
5. (Currently Amended) ~~Device~~ The device according to claim 3, in which the ~~resonance~~ high frequency is in the interval from 1 kHz to 20 kHz.
6. (Currently Amended) ~~Device~~ The device according to claim 3, in which the ~~modulation~~ low frequency is in the interval from 0.5 Hz to 10 Hz.
7. (Currently Amended) ~~Device~~ The device according to claim 1, in which the crucible is a cold crucible ~~(2)~~.
8. (Currently Amended) ~~Device~~ The device according to claim 1, in which the crucible is a hot crucible ~~(28)~~.
9. (Currently Amended) ~~Device~~ The device according to claim 1, in which the frequency of the component which is ~~capable of agitating~~ configured to agitate the interface of the first and second phases is chosen low enough for the component to also be ~~capable of agitating~~ configured to agitate the second phase, when the latter is little electrically conductive, this second phase being above the first phase.
10. (Currently Amended) ~~Device~~ The device according to claim 1, ~~including in addition means (26) for controlling~~ further comprising a control mechanism configured to control thermal gradients inside the first and second phases.
11. (Currently Amended) ~~Device~~ The device according to claim 10, ~~in which these wherein the control means comprise screens or susceptors (26)~~ mechanism comprises a screen or a susceptor.

12. (Currently Amended) ~~Application of the~~ The device according to claim 1 ~~to fusion and interfacial agitation of a diphasic system in which~~ , wherein the first phase (8) is a metal and the second phase (10) is a slag or a salt.